Chapter 2

Army Airspace Command and Control Fundamentals

Army airspace command and control ensures that forces coordinate their use of airspace. It also improves the force commander's ability to command and control those forces using airspace. An effective Army airspace command and control (A2C2) system enables all the battlefield operating systems (BOS) to function efficiently while synchronizing air operations to support the commander's intent. In addition, A2C2 supports command and control (C2) requirements during force projection operations and is fully integrated into the theater. This chapter discusses the basics of the A2C2 system: functions, activities, operations, and organizations.

> The term A2C2 does not denote that any airspace contiguous to the battlefield or any other geographical dimension of airspace is designated "Army" airspace but refers to the Army users of the airspace. Neither does it imply command of any asset that is not assigned or under operational control to any Army commander.

A2C2 SYSTEM OVERVIEW

2-1. Joint forces use airspace to conduct air operations, deliver fires, employ air defense artillery assets, and conduct intelligence operations. To effectively use airspace, commanders must prudently command and control the Army airspace users. A2C2 is the Army's operational approach to accomplishing the functional activity of airspace control. A2C2 enhances command and control of forces using airspace and synchronizes their use of the airspace. The A2C2 system includes functions, activities, functional operations, and command and control

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organizations. A2C2 aims to maximize the combat effectiveness of all airspace users without adding undue restrictions and with minimal adverse impact on their capabilities. This system arranges staff elements in each command echelon from maneuver battalion through numbered army. It includes organic echelon C2 staff personnel, air defense artillery (ADA) command and control elements, fire support coordination elements, intelligence staff elements, Army air traffic service (ATS) command and control elements, and liaison personnel with key facilities of the airspace control authority (ACA). These elements work to support Army commanders and with the ACA to link elements of the Army Air-Ground System (AAGS) to other elements of the Theater Air-Ground System (TAGS). Commanders and staff must see the entire common operational picture (COP). They can then command and control operations in Army airspace. For commanders to achieve situational understanding, they must ensure that assets, systems, and personnel provide timely, relevant, and accurate information and intelligence.

A2C2 FUNCTIONS

2-2. All airspace users must perform four functions: identification, coordination, integration, and regulation. As discussed, these functions are airspace specific.

IDENTIFICATION

2-3. Identification is the ability to identify all the airspace users and how they will use the airspace. It uses positive or procedural means to determine friendly or hostile manned or unmanned aircraft, missiles, and other airspace users. Identification allows for the timely engagement of enemy aircraft and missiles while minimizing potential fratricide.

COORDINATION

2-4. Coordination is the exchange of information to inform, synchronize, and deconflict operations. In the A2C2 context, coordination synchronizes the activities of all airspace users to achieve effective, efficient, and flexible airspace use. Effective coordination enables integration.

INTEGRATION

2-5. Integration is the consolidation of airspace requirements and assets beginning at the lowest echelon possible and with the correct organization. Planners must ensure that every element works together to apply each asset to every operation. Integration embraces every echelon up to the theater level and beyond. It unites the many systems from Army, joint, and multinational sources and from every battlefield operating system. Under the supervision of the G3/S3 air, ATS personnel integrate the A2C2 element for all airspace users.

REGULATION

2-6. Regulation is the application of promulgated rules and procedures on all airspace users. To achieve the greatest combat effectiveness, regulation must be flexible and not interfere with friendly forces' ability to accomplish their mission. Regulation assists in the command and control of airspace activities to prevent conflicts among the various uses and users of airspace. Regulation is accomplished through various control measures.

A2C2 ACTIVITIES

2-7. When the four functions are in place, they allow for successfully accomplishing the five basic and indivisible activities of A2C2. These activities are command and control, air defense (AD), fire support coordination, air traffic control, and airspace management.

COMMAND AND CONTROL

2-8. An effective command and control system at all echelons is critical to accomplishing missions. Commanders must thoroughly plan, continuously review, and clearly define A2C2 procedures and directives to maximize combat power while minimizing potential hazards. The C2 system must be jam resistant, secure, and reliable enough to expediently disseminate airspace C2 information.

AIR DEFENSE

2-9. A2C2 planners recommend C2 procedures and rules of engagement that reduce the potential firing of AD weapons on friendly aircraft while allowing quick engagement of hostile aircraft and missiles. Timely procedures for identifying aircraft are essential. Pilots and weapon systems operators must easily understand and execute these procedures.

FIRE SUPPORT COORDINATION

2-10. Responsive fire support weapon systems are critical to the maneuver commander's scheme of maneuver. Such responsiveness requires detailed planning, integration of all fire support systems, C2 systems, and effective fire control measures. These control measures include fire support coordinating measures (FSCMs) that the land or amphibious commander uses to rapidly engage targets and simultaneously provide safeguards for friendly forces. FM 3-09 discusses FSCM. Some fire support weapons can significantly impact air operations and must be included in A2C2 planning and execution.

AIR TRAFFIC CONTROL

2-11. Air traffic control is the use of active and passive measures to identify, locate, and regulate aircraft operating in the airspace control area. Regulating air traffic promotes air safety, facilitates identification of aerial platforms, and contributes to optimizing air defense assets. Air traffic control includes terminal procedures that focus on controlling aerial platforms at a specific landing or takeoff site, as well as, en route procedures.

AIRSPACE MANAGEMENT

2-12. A2C2 elements must integrate, coordinate, deconflict, and disseminate critical airspace information. This includes horizontal information flow to adjacent units and vertical information flow to higher and lower units or organizations. Overarching policies, guidance, and the commanders' intent help determine how commanders manage the airspace.

A2C2 FUNCTIONAL OPERATIONS

2-13. Although only five functional activities of A2C2 exist, various organizations at each echelon conduct many functional operations. Each operation can significantly impact A2C2. These functional operations are fire support operations, air defense artillery operations, Army aviation operations, intelligence operations, intratheater airlift operations, amphibious operations, and joint and multinational operations.

Functional Operations

- **Fire Support**
- **Air Defense Artillery**
- **Army Aviation**
- **Intelligence**
- **Intratheater Airlift**
- **Amphibious**
- **Joint and Multinational**

FIRE SUPPORT OPERATIONS

2-14. Fire support facilitates rapidly engaging targets and, at the same time, provides safeguards for friendly forces by using fire support coordinating measures and a network of fire support teams, liaison parties, and the fire support elements (FSEs). Fire support coordinating measures enhance the expeditious attack of targets; protect forces, populations, critical infrastructure, and sites of religious or cultural significance; and set the stage for future operations. Interface between FSEs and A2C2 element representatives ensures that requirements are coordinated rapidly and information is exchanged quickly.

2-15. The close interface of fire support as a function of A2C2 ensures that planned artillery fires are routinely coordinated with air operations and that planned air activities are coordinated with ground operations. To reduce potential conflicts between surface-to-surface indirect fires and aircraft, the FSE must provide the A2C2 element with firing battery locations and fire support plans and activities. The A2C2 element disseminates this information to all aviation, ATS, and tactical air elements. The A2C2 element also must coordinate with the ACA, deconflicting all friendly and neutral aircraft per guidance of the joint force commander (JFC). The Multiple Launch Rocket System, Army Tactical Missile System, and other indirect fires—cannon and mortar—will affect the airspace. Such coordination deconflicts fires, air operations, and ground operations.

AIR DEFENSE ARTILLERY OPERATIONS

2-16. Air rules and procedures established by the area air defense commander (AADC) control air defense fires. He manages the integrated air defense through a combination of positive and procedural controls.

2-17. Air defense rules of engagement specify the circumstances and limitations under which air defense artillery forces initiate or continue combat engagements. The seven components of air defense rules of engagement are—

- Right of self-defense.
- Hostile criteria.
- Level of control.
- Weapons control status.
- Modes of control.
- Autonomous operations.
- Fire control orders.

2-18. Supplemental fire control measures for air defense artillery include—

- Air defense operations area.
- Weapon engagement zone.
- High-density airspace control zone.
- Temporary airspace restrictions.
- Low-level transit routes and other air corridors.

2-19. Army ADA operations are controlled from tactical operations centers, fire direction centers (FDCs), and command posts established at the Army Air and Missile Defense Command (AAMDC) through battery levels. The FDCs that coordinate the high-to-medium-altitude air defense fires of ADA units are located at the ADA brigade and battalion levels. Local radar and automated C2 systems—linked with the joint data network and controlling authority—support the FDCs. Short-range air defense fires are controlled procedurally by using primary target lines and sectors of fire. The design of the defense and weapon capabilities determines these lines.

ARMY AVIATION OPERATIONS

2-20. Army aviation depends on commanders effectively using airspace to accomplish missions. Through airspace command and control, commanders fully synchronize combat activities and employ aviation assets and air maneuver to contribute decisively to the battle's outcome. Army aviation operations are generally conducted in the terrain flight dimension of the battlefield, which is fundamentally linked to ground maneuver at all echelons. The terrain flight environment consists of the airspace below the coordinating altitude and its buffer in which the Army rotary-winged aviation generally operates.

2-21. Aviation units are organized to conduct attack, air assault, reconnaissance, intelligence, and logistic operations. Airspace requirements for Army aviation cover a broad category of units and special requirements. Aircraft assigned to the aerial exploitation battalion and operating out of the corps rear area have unique airspace requirements. Aviation units operating primarily in the communications zone (COMMZ) and corps rear areas have different requirements than those operating in the division area and forward.

2-22. Attack helicopters, air cavalry, and aviation companies and battalions involved in air assault operations conduct combat operations as a tactical formation and respond to the tactical directions of an aviation command and control system. As such, ACA policy and procedures concerning air traffic management, identification of airspace users, and flight following are implemented differently than for aircraft operating in the COMMZ and rear area.

2-23. In the ground maneuver brigade area of operations, air traffic generally operates in the terrain flight environment. Aircraft provide rapid, flexible responses to the requirements of the commander. This requires flexibility in airspace control procedures. Aviation units in this area employ procedural control measures. Attack helicopter battalions and air cavalry units exercise procedural control over forces through the command and control system. They use control measures, such as objectives, areas of operations, axis of advance, phase lines, boundaries, battle positions, assembly areas, and forward arming and refueling

points. Chapter 4 discusses control measures, such as air corridors and air axis as well as other tactics, techniques, and procedures.

2-24. In the rear area, air traffic usually moves among support areas, key support command facilities (major base clusters), airfields, and command and control sites. Movement is usually predictable, follows routes that afford ease of navigation, provides for masking from the threat, avoids restricted areas and other hazards, and is at greater flight altitudes. Aircraft operations are managed primarily by adhering to standard airspace control measures and more positive means of control. Adherence to identification, friend or foe procedures; flight following requirements; and monitored ATS facilities has greater emphasis in this area. FM 3-04.100 has detailed information on aviation operations.

INTELLIGENCE OPERATIONS

2-25. The intelligence staff develops an integrated intelligence, surveillance, and reconnaissance (ISR) plan. ISR assets include both air and ground assets, which collect to answer the commander's requirements. Airborne assets consist of rotary-wing, fixed-wing, and unmanned aerial vehicles (UAVs). A2C2 planners should anticipate greater UAV usage at increasingly lower levels. Missions are planned for inclusion in the air tasking order (ATO) and airspace control order (ACO). However, because of their flexible, highly responsive nature, assets are often tasked for immediate missions not in the ATO or ACO. The A2C2 system at each echelon must resolve conflicts between airborne intelligence assets and those of other airspace users. The G2 or S2 provides the information required for coordinating intelligence collection missions with the A2C2 element to synchronize these missions with other airspace operational requirements, especially air defense forces.

INTRATHEATER AIRLIFT OPERATIONS

2-26. Intratheater airlift refers to air transport of supplies, personnel, and equipment by Army rotary-wing and fixed-wing aircraft and Air Force intratheater fixed-wing aircraft. Airlift operations include all missions except those involving the movement of combat forces to contact in an objective area.

2-27. The rear area normally contains small austere airfields to handle intratheater Air Force aircraft as well as Army aviation forces supporting airlift requirements. Intratheater fixed-wing aircraft fly airlift missions to support tactical Army operations using air-land or airdrop delivery methods. Employing airlift forward is a command decision based on the factors of mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC); available assets; and mission priority. Army rotary-wing aircraft conduct airlift operations throughout the rear area and to support shaping operations.

2-28. Airspace requirements for airlift missions require coordination between members of the A2C2 element and airlift managers and planners. These individuals are the movement control officer, the transportation officer, the Air Force tactical airlift liaison officer, members of the appropriate A2C2 elements, and the liaison officer provided by the aviation unit.

AMPHIBIOUS OPERATIONS

2-29. Army forces participating in amphibious operations exercise airspace control techniques and procedures under the guidance and direction of the commander, amphibious task force (CATF). The joint force commander assigns to the CATF the amphibious objective area, which includes airspace.

2-30. The Naval Tactical Air Control System (NTACS) contains those naval command, control, and communications facilities responsible for airspace control functions during amphibious operations. The major element of the NTACS is the tactical air control center which includes—

- Air traffic control section.
- Supporting arms coordination center (similar to the Army's fire support element).
- Air support control section (similar to the Air Force's air support operations center).
- Antiair warfare section (similar to the control and reporting center).
- Sector air defense coordination center.

2-31. Army forces operating in the amphibious objective area that require airspace interface with the CATF's Tactical Air Control System through the elements of the A2C2 system. Liaison and the co-location of functional elements provide timely coordination and integration of airspace users.

2-32. As the tactical situation develops and command and control agencies of the amphibious task force are established ashore, the control of fire support, air operations, and air defense transfer from the CATF to the landing force commander.

JOINT AND MULTINATIONAL OPERATIONS

2-33. Coordinating and integrating Army airspace operational requirements with those of the other services and multinational forces occur at all echelons of command. This coordination and integration effort is accomplished by interfacing the A2C2 system with the Tactical Air Control Systems of the other services and multinational forces.

COMMAND AND CONTROL ORGANIZATIONS

C2 Organizations

- **Command Post**
- **Fire Support Element**
- **A2C2 Element**
- **Army Air and Missile Defense Command**
- **ADA Brigade**
- **Special Operations Component**

2-34. Command and control organizations synchronize and coordinate combat power on the battlefield and provide the direction to the fight. JP 1-02 defines *command and control* as the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Commanders employ forces using a command and control system. A *command and control system* is the arrangement of personnel, information management, procedures, and equipment and facilities essential to the commander to plan, prepare for, execute, and assess operations (FM 6-0). For properly managing A2C2, a myriad of organizations must closely coordinate

their efforts. These C2 elements are positioned throughout the theater structure from theater Army level to division level in formal organizations and below division as ad hoc elements. Chapter 3 discusses in detail each element's role and task. However, a brief overview is presented here of each element's role in Army A2C2.

COMMAND POST

2-35. Command posts (CPs) function at every level of command. The commander employs this facility to control combat operations. During A2C2 operations, staff of each CP ensures that A2C2 synchronizes with the scheme of maneuver and tracks the airspace picture relevant to their command's current and future operations.

FIRE SUPPORT ELEMENT

2-36. The fire support element of a command post manages centralized targeting, coordination, and integration of fires delivered on surface targets by fire support means under the control, or in support, of their assigned forces. In A2C2, the FSE coordinates friendly fires against surface targets with other staff elements ensuring that these fires do not impact on simultaneously conducted air operations.

ARMY AIRSPACE COMMAND AND CONTROL ELEMENT

2-37. The A2C2 element is the Army's principal organization responsible for airspace control. The A2C2 element is located within the CPs established by each echelon. These elements dedicated to accomplish A2C2 tasks are located at division level and above. A2C2 elements below division level are formed on an ad hoc basis and must determine how to meet the commander's A2C2 needs. The A2C2 elements at division and above fall under the staff responsibility of the Army chief of staff or G3 and are supervised by the G3 air. These elements consist of representatives from, but not limited to, the elements listed in the text box. For A2C2 elements supported by the Air and Missile Defense Planning and Control System and Tactical Airspace Integration System, unique data link capabilities permit a rapid transfer of A2C2 information and near-real time update of the air picture.

A2C2 Element Representatives

- **ADA Element**
- **Aviation Element**
- **Air Liaison Officer**
- **Fire Support Element**
- **ATS Company—supporting the unit at division and higher level**
- **Military Intelligence Unit**
- **G2 Section and UAV Chief**
- **G4 Section**
- **Marine Corps Air or Naval Gunfire Liaison Company, when required**

ARMY AIR AND MISSILE DEFENSE COMMAND

2-38. The AAMDC commander must plan, coordinate, and integrate air and missile defense operations for the ARFOR commander or, if designated, the joint force land component commander (JFLCC). The AAMDC commander ensures that these operations are properly executed. He accomplishes these functions through several activities:

- Commands echelons above corps ADA forces and oversees operational level planning to support brigade operations; ensures that the brigades are postured to protect theater forces and assets. He also facilitates the force projection of the brigades and resolves brigade support issues.
- Serves as the theater Army air and missile defense coordinator (TAAMDCOORD) and acts as a special staff officer to the ARFOR or JFLCC commander. The TAAMDCOORD ensures that Army operations are integrated with counterair operations at the theater level.
- Supports the joint force air component commander (JFACC), area air defense commander, and airspace control authority by serving as a deputy AADC; ensures that the Army's contribution to the joint fight is planned, coordinated, and synchronized with the JFACC, AADC, and ACA concepts of operations.
- Shares, through his G2 and attack operations elements, intelligence preparation of the battlefield information with the deep operations coordination cell (DOCC) and the G2.
- Provides target nominations to the DOCC and the G3 for immediate targeting, time-sensitive targets, and the ATO process.
- Exercises either operational or tactical control (or as determined by the JFC) of assigned multinational forces.
- Coordinates with the corps ADA brigades to ensure that their operations integrate and synchronize with the theater air defense plan.
- Disseminates through his passive defense element an early warning to affected ARFOR units and, when requested, to joint and multinational units or the populace in the ARFOR area of operations.
- Deploys liaison officers to critical theater and ARFOR command and control nodes. These officers provide the essential coordination to prosecute the fight efficiently. They keep commanders and staffs apprised of the status of operations and recommend appropriate courses of action relative to air and missile events. They also serve as subject matter experts on the capabilities of the AAMDC and its subordinate ADA forces.

AIR DEFENSE ARTILLERY BRIGADE

2-39. The AAMDC commands echelons above corps (EAC) air defense artillery brigades. The EAC air defense artillery brigade provides command and control for subordinate ADA assets. This brigade provides air and missile defense of prioritized theater assets. Corps ADA brigades are under the command of their respective corps commanders. The corps ADA brigade provides C2 for subordinate ADA assets and provides air and missile defense of prioritized corps defended assets. For airspace control relative to identification and engagement operations, the AADC designates an authority to control the fires of both EAC and corps ADA brigades. Both EAC and corps ADA brigades possess data link capabilities. These capabilities help brigades to integrate at all levels of the tactical digital information link (TADIL) architectures and participate in the joint data network. This allows brigades to rapidly transfer and update information relative to the integrated air picture.

SPECIAL OPERATIONS COMPONENT

2-40. The special operations command (SOC) provides powerful operational leverage across strategic, operational, and tactical levels. The theater SOC normally exercises operational control of all assigned special operations forces (SOF) in theater. The SOC may be designated as the joint force special operations component commander (JFSOCC). The JFSOCC will control assigned SOF as well as any conventional assets provided by the JFC to support specific missions. Tactical control of SOF air assets is normally exercised by the Air Force special operations component, the Army special operations aviation commander, or the joint special operations air component commander. The SOC command and control structure will be situationally dependent.